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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* CHENG-CHIEH LIU, YAO-LUNG HUANG, MING-SHI TSAI, and WEN-SHI HUANG

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Appeal 2009-0108  
Application 10/776,510  
Technology Center 2800

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Decided: January 15, 2009

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Before KENNETH W. HAIRSTON, JOHN A. JEFFERY, and MARC S. HOFF, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 1 to 17. We have jurisdiction under 35 U.S.C. § 6(b).

We will sustain the rejection.

Appellants have invented a motor speed control device applied to a fan that comprises a thermal sensor for detecting an environmental temperature of the fan, a driving element for driving the fan to a specific speed according to the detected temperature, and a control element electrically connected between the driving element and the thermal sensor for adjusting the voltage of the thermal sensor to change a rotation speed and a temperature range of the fan (Fig. 3A; Spec. 2, 3, 5, and 6).

Claim 1 is representative of the claims on appeal, and it reads as follows:

1. A motor speed control device, applied to a fan, comprising:
  - a thermal sensor detecting an environmental temperature of the fan;
  - a driving element driving the fan to a specific speed according to the detected temperature; and
  - a control element connected electrically between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor to change a rotation speed and a temperature range of the fan.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Cheng

US 5,197,858

Mar. 30, 1993

The Examiner rejected claims 1 to 17 under 35 U.S.C. § 102(b) based upon the teachings of Cheng.

#### ISSUE

Appellants argue *inter alia* that Cheng does not include a control element that adjusts the voltage of the thermal sensor to change the rotation speed and temperature range of the fan as set forth in the claims on appeal (App. Br. 6 and 7). Thus, the issue before us is: have the Appellants shown that Cheng does not describe a control element that adjusts the voltage of the thermal sensor to change the rotation speed and temperature range of the fan?

#### FINDINGS OF FACT

1. As indicated *supra*, Appellants describe and claim a motor speed control device electrically connected between a thermal sensor that detects

an environmental temperature of a fan, and a driving element that drives the fan to a specific speed according to the detected temperature. The control element adjusts a first voltage of the thermal sensor to change a rotation speed and temperature range of the fan.

2. Cheng describes a motor speed control device (Fig. 2) applied to a fan that comprises a thermal sensor  $R_{th}$  for detecting an environmental temperature of the fan (col. 1, ll. 8 to 10 and 48 to 51; col. 2, ll. 1 to 3), a driving element (i.e., a Hall element IC1 and a driving IC IC2 for driving the fan to a specific speed according to the detected temperature (col. 2, ll. 31 to 55), and a control element (i.e., operational amplifier IC31 and transistors TR1 and TR2) electrically connected between the driving element and the thermal sensor for adjusting a first voltage of the thermal sensor to change a rotation speed and a temperature range of the fan (col. 2, l. 56 to col. 3, l. 35). In Cheng, variable speed by thermal control is achieved via the variable voltage output  $V_o$  from the operational amplifier IC31 in the control element which causes the collector current of transistor T1 to change to thereby change the speed of the fan (col. 3, ll. 1 to 4, 26 to 30, and 45 to 52).

3. In Cheng, the transistors TR1 and TR2 operate in unison with comparator/operational amplifier IC31, and resistors  $R_a$  and  $R_b$  to form a switching circuit.

4. In Cheng, the resistors  $R_9$  and  $R_{10}$  are electrically connected in parallel with the thermal sensor  $R_{th}$ , and the voltage  $V_{th}$  is compared with  $V_{ref}$  to produce a variable voltage output  $V_o$  that turns on the transistor TR2 to thereby control the temperature range and the speed of the fan (col. 2, l. 56 to col. 3, l. 26).

5. In Cheng, the resistor  $R_4$  is electrically connected in series with the thermal sensor  $R_{th}$ .

6. In Cheng, the control element includes a subtraction circuit comprised of comparator/operational amplifier IC31, and resistors R5 to R13 that operate together to reduce the temperature range of the fan to a full speed (col. 2, l. 56 to col. 3, l. 26).

7. In Cheng, the control element includes a division circuit formed by resistors R9 and R10, a comparator/operational amplifier IC31, and an output circuit that comprises resistors Ra and Rb and transistors TR1 and TR2.

### PRINCIPLES OF LAW

Anticipation is established when a single prior art reference discloses expressly or under the principles of inherency each and every limitation of the claimed invention. *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994).

### ANALYSIS

With regard to the Appellants' argument that Cheng does not include a control element that adjusts the voltage of the thermal sensor to change the rotation speed and temperature range of the fan, we find that the variable voltage output  $V_o$  from the comparator/operational amplifier IC31 in the control element accomplishes the exact functions as set forth in claims 1 to 3 and 17 on appeal (Findings of Fact 2). The motor speed control device described by Cheng includes a thermal sensor  $R_{th}$  that detects an environmental temperature of the fan, and a driving element in the form of a Hall sensor and a driver IC that drives the fan to a specific speed according to the detected temperature (Finding of Fact 2).

Turning to claims 4 and 5, the transistors TR1 and TR2 in Cheng operate in unison with comparator/operational amplifier IC31 and resistors Ra and Rb to form a switch circuit (Finding of Fact 3).

With respect to claims 6 and 14, the resistors R9 and R10 in Cheng are electrically connected in parallel with the thermal sensor Rth, and the comparator/operational amplifier IC31 compares Vth with Vref to produce a variable voltage output Vo that turns on the transistor TR2 to thereby control the temperature range and the speed of the fan (Finding of Fact 4).

Turning next to claims 7 and 15, the resistor R4 in Cheng is electrically connected in series with the thermal sensor Rth (Finding of Fact 5).

A subtraction circuit as set forth in claims 8 to 10 and 16 is found in Cheng's control element (i.e., comparator/operational amplifier IC31, and resistors R5 to R13 that operate together to reduce the temperature range of the fan to a full speed).

Turning lastly to claims 11 to 13, the control element in Cheng includes a division circuit formed by resistors R9 and R10, a comparator/operational amplifier IC31, and an output circuit that comprises resistors Ra and Rb and transistors TR1 and TR2 (Finding of Fact 7).

In summary, Cheng describes the motor speed control device elements set forth in claims 1 to 17. *Atlas Powder Co.*, 190 F.3d at 1347; *Paulsen*, 30 F.3d at 1478-79.

#### CONCLUSION OF LAW

Appellants have not shown any error in the Examiner's findings that Cheng describes the motor speed control device elements set forth in claims 1 to 17.

ORDER

The anticipation rejection of claims 1 to 17 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

gvw

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